



U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

# Memorandum

Subject: **ACTION**: Review and Concurrence, Equivalent Level of  
Safety Finding for Cessna New Model 680  
FAA Project #TC2548WI-T

Date: **April 9, 2004**

From: Manager, Airframe & Cabin Safety Branch, ANM-115

Reg Ref: §§ 25.811(d)(1) and  
25.812(b)(1)

Reply to  
Attn. of: T.N. Baktha, ACE-  
118W

To: Manager, Wichita Aircraft Certification Office, ACE-  
115W

ELOS  
Memo #: TC2548WI-T-AG-4

## Background

Cessna Aircraft Company is requesting that Cessna Model 680 be certificated for 13 passengers in addition to 2 crewmembers. Cessna requested an Equivalent Level of Safety finding to: 1) § 25.812(b)(1) for the reduction of the background area requirement of the main cabin door exit locator/marketing sign, the escape hatch emergency exit locator/marketing sign, and the divider escape hatch emergency exit locator sign, and 2) § 25.811(d)(1) for allowing the exit signs to serve as both an exit marking sign and an exit locator sign. Although, all of the aforementioned exit locator/marketing signs comply with all of the regulations for aircraft having 9 or less passengers (§ 25.812(b)(2)), the Model 680, having a maximum seating passenger capacity of 13 passengers, will comply with the regulations of § 25.812(b)(1), with the exception of the background areas.

## Applicable regulation(s)

§§ 25.811(d)(1) and 25.812(b)(1) - Exit Locator and Exit Marking Signs

## Regulation requiring an ELOS

§§ 25.811(d)(1) and 25.812(b)(1) - Exit Locator and Exit Marking Signs

## Description of compensating design features or alternative standards which allow the granting of the ELOS (including design changes, limitations or equipment need for equivalency)

Compensating factors which provide an Equivalent Level of Safety to the requirements of §§ 25.812(b)(1) and 25.811(d)(1) as required by § 21.21 for the Model 680 are summarized as follows:

- The attention getting characteristics of the configuration meet or exceed the requirements of § 25.812(b)(1) in the areas of total illumination intensity as well as contrast.
- The Model 680 cabin is diminutive in size with respect to the size of cabins contemplated in the intent of § 25.812(b)(1). In addition, the Model 680 has a single row of seats on each side of the aisle and a cabin width equal to the Model 650 and the Model 750 (5.5 feet). This cabin size creates a condition in which all exit locator and marking signs become easily legible (seen and read).

- Similar and/or identical exit signs were previously granted an Equivalent Level of Safety for similar aircraft. The Model 680 has less than or equal to cabin lengths of other approved aircraft with similar configurations and therefore, the exit signs are considered a more appropriate design.
- The Exit Locator Sign and both Exit Marking signs meet all of the requirements of § 25.812(b)(2), which covers 9 passengers or less (excluding crew). The Model 680 will be certified for 13 passengers (plus 2 crew), an increase of only four passengers. Again, the Model 680 is small compared to the average size of aircraft in the Large Aircraft (Transport) category. The Model 680's cabin length is identical for passenger seating configurations of 9 passengers or less and for 10 passengers or more. Therefore, the viewing distance is the same regardless of the passenger capacity.
- The exit locator sign and the exit marking signs are installed in the most appropriate locations for the seating configurations. Each of the signs can be seen and read from the most adverse position for which their use were intended.

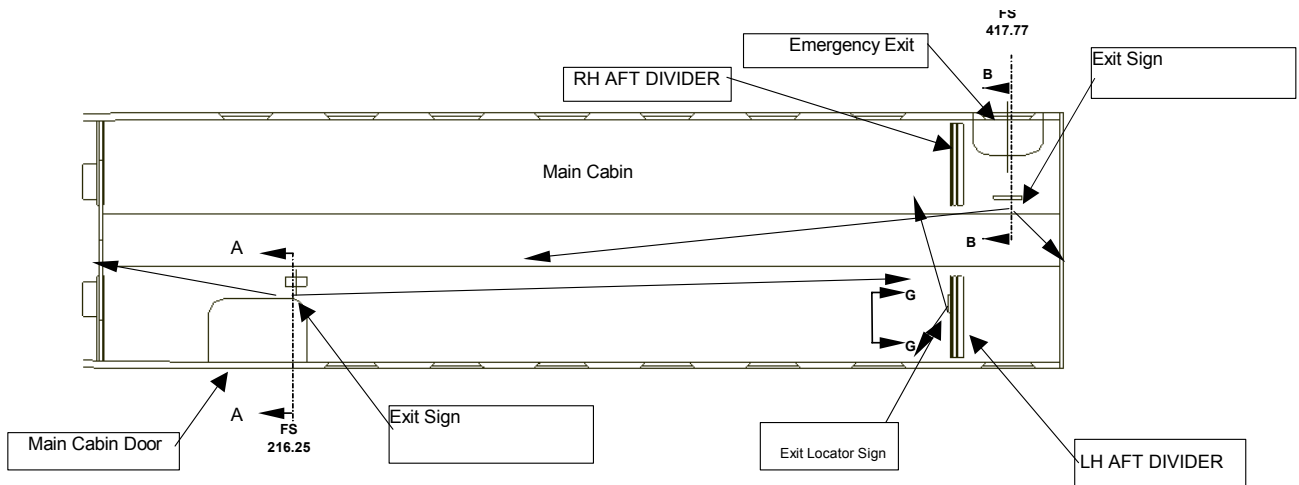


FIGURE 1  
TOP VIEW OF MODEL 680 WITH VIEWING ANGLES

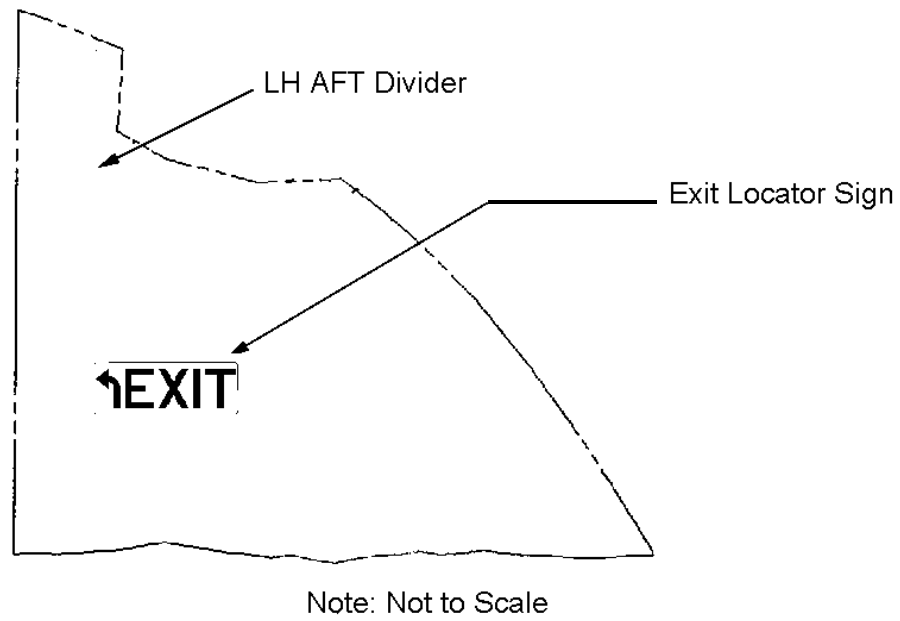


FIGURE 2  
LH AFT DIVIDER - EXIT LOCATOR SIGN INSTL.  
VIEW G-G FIG. 1

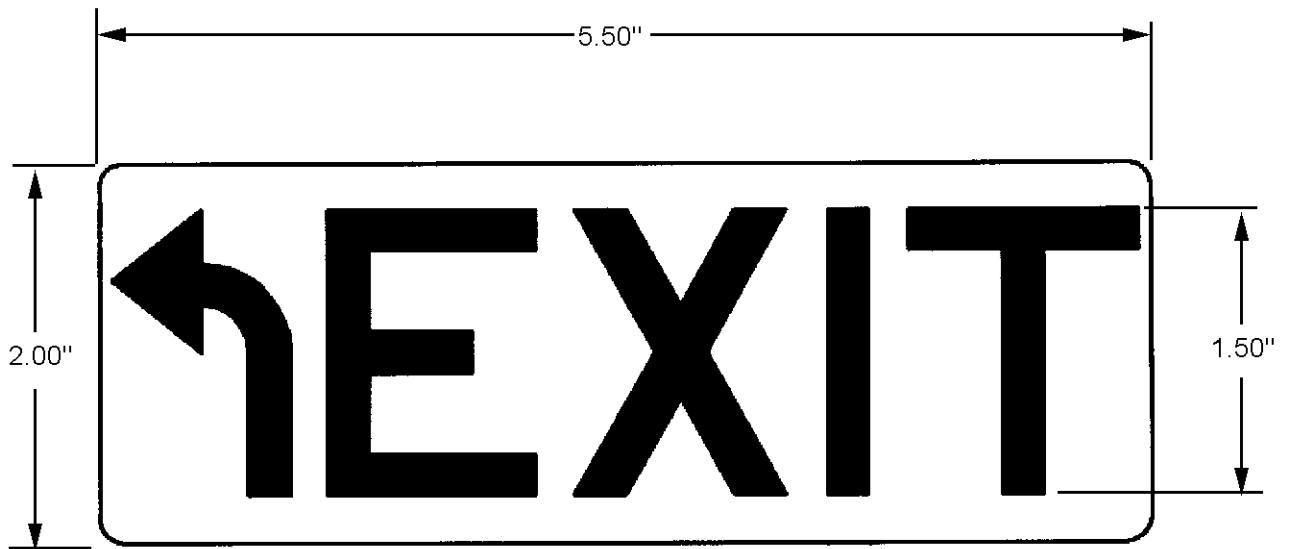


FIGURE 3  
EXIT LOCATOR SIGN ASSY

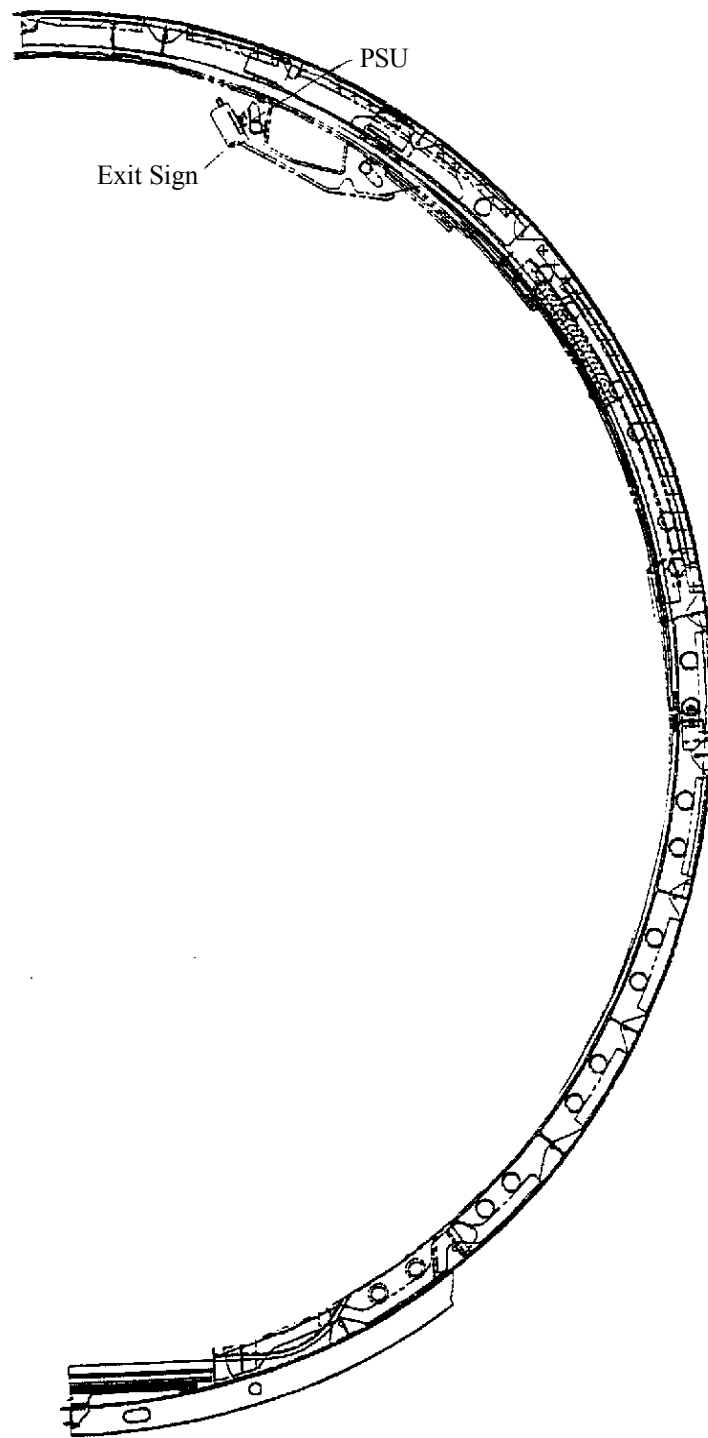


FIGURE 4  
EXIT LOCATOR/MARKING SIGN  
EMERGENCY ESCAPE HATCH  
VIEW B-B FIG. 1

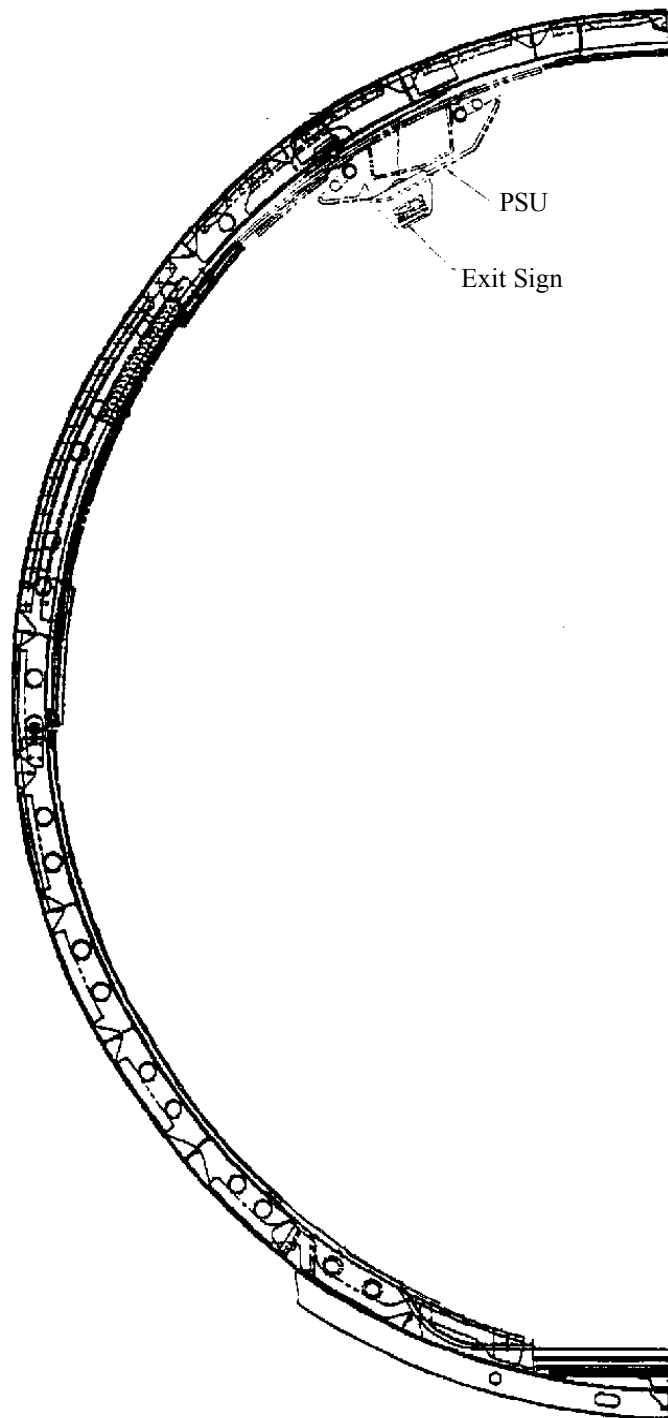


FIGURE 5  
EXIT LOCATOR/MARKING SIGN  
MAIN PASSENGER CABIN DOOR  
VIEW A-A FIG. 1

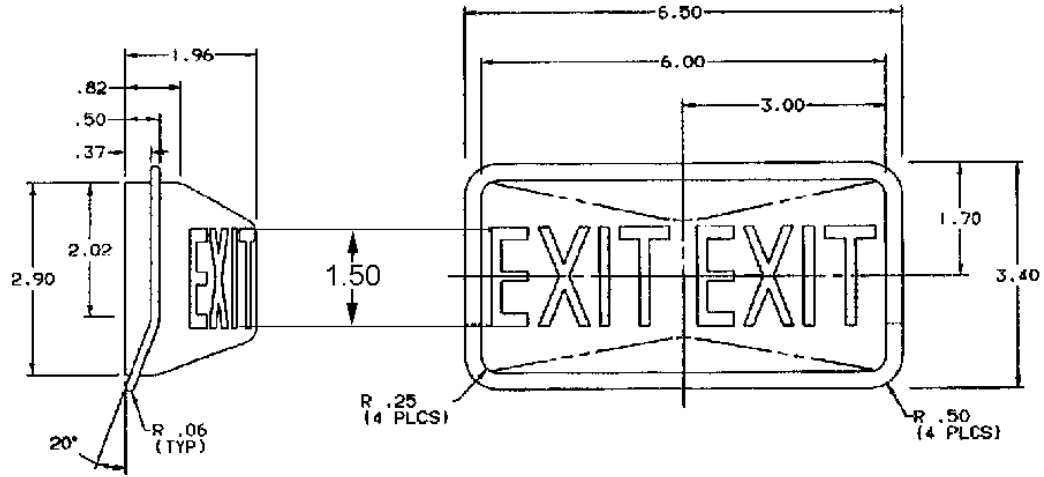


FIGURE 6  
EXIT LOCATOR/MARKING SIGN

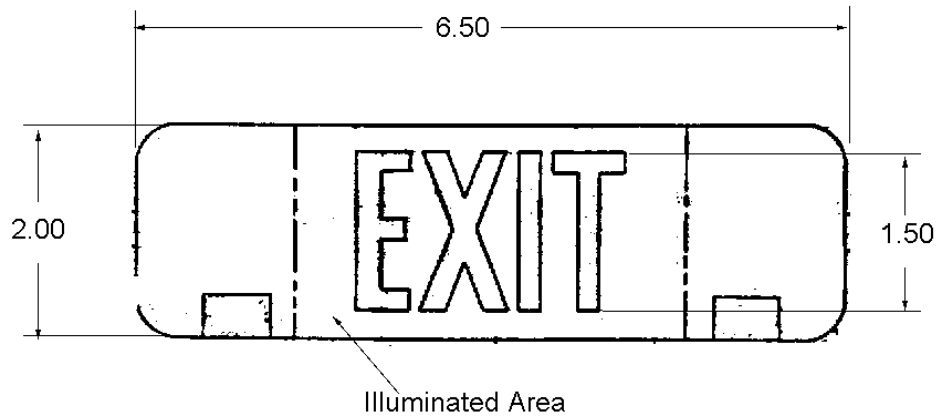


FIGURE 7  
EXIT LOCATOR/MARKING SIGN

## **Explanation of how design features or alternative standards provide an equivalent level of safety intended by the regulation**

The Cessna Model 680 aircraft maintains the interior fuselage diameter of existing Models; 560XL, 650 and 750's fuselage. The Model 680 will be certified for 13 occupants, plus two crew members. The main cabin door and the emergency escape hatch are located as shown in FIGURE 1.

### **MAIN PASSENGER CABIN DOOR:**

The Exit Locator/Marking Sign (Ref. FIGURE 6) is installed above the main cabin door (FIGURE 5). The sign is a wedge shaped (2 flat illuminated white surfaces) sign with the word "EXIT" printed, in red, on both surfaces. This exit sign can be easily read and seen from any aisle position in the aircraft as shown in the viewing angles in FIGURE 1. This sign functions as both an Exit Locator Sign {§ 25.811(d)(1)} and as an Exit Marking Sign {§ 25.811(d)(2)}. This sign meets all of the requirements of § 25.812(b)(1)(i) with the exception of the background area. This sign may also be installed above the Type III Emergency Exit in the case of a floorplan with no dividers and high density configuration.

### **TYPE III EMERGENCY EXIT**

The Type III Emergency Exit escape hatch for the Model 680 is located on the RH side of the Aft vanity area. For the standard floorplan, it's view is obstructed by a divider panel, preventing a passenger occupying a seat in the main cabin from directly seeing the escape hatch and the exit marking sign. (FIGURE 1). Therefore, the location of the escape hatch is marked by an Exit Locator Sign {§ 25.811(d)(1) and (3)} and an Exit Marking Sign {§ 25.811(d)(2)}. There is an exit locator sign installed on the forward side of the LH Aft Divider and there is an exit marking sign above the Type III Emergency Escape Hatch. The exit sign installed above the emergency exit serves two functions; an Exit Locator Sign {§ 25.811(d)(1)} and as an Exit Marking Sign {§ 25.811(d)(2)}. As shown in FIGURE 1, an occupant can obviously see and read the exit sign from the aisle in front of the exit and from the doorway that enters the aft vanity.

### **EXIT LOCATOR SIGN:**

The Exit Locator Sign Assembly is installed on the forward side of the LH AFT Divider as shown in FIGURE 2. The exit sign is composed of red letters ("EXIT") on an illuminated white background. The Exit Locator Sign is located at a position in which any occupant whose height is between the 95th percentile male to the 5th percentile female can clearly see and read (the sign). The sign meets all of the requirements of § 25.812(b)(1)(i) as it pertains to § 25.811(d)(3), with the exception of the background area.

**EXIT MARKING SIGN:**

The Exit Marking Sign is centered above the emergency escape hatch (FIGURES 1 and 4). As previously mentioned, this dual function (Exit Locator and Exit Marker) sign is installed per the requirements of § 25.811(d)(1) and (2). The sign is made of 1 1/2" red letters on a illuminated white background. The exit sign can be seen and read from any position in the lavatory and from the doorway entrance into the Aft lavatory. This exit marking sign is identical to the exit sign certified for use on the Cessna Model 650 aircraft per an Equivalent Level of Safety finding.

The Models 650 and 680 have similar fuselage diameters and cabin lengths. The Exit Marking Sign complies with all requirements of § 25.812(b)(1) with the exception of the background area.

**FAA approval and documentation of the ELOS**

The FAA has approved the aforementioned Equivalent Level of Safety Finding in Issue Paper AG-4. This memorandum provides standardized documentation of the ELOS that is non-proprietary and can be made available to the public. The Transport Directorate has assigned a unique ELOS Memorandum number (see front page) to facilitate archiving and retrieval of this ELOS. This ELOS Memorandum Number should be listed in the Type Certificate Data Sheet under the Certification Basis section. [E.g. Equivalent Safety Findings have been made for the following regulation: §§ 25.811(d)(1) and 25.812(b)(1) - Exit Locator and Exit Marking Signs (documented in TAD ELOS Memo TC2548WI-T-AG-4)]

/s/

Signature: Alan Sinclair for  
 Manager, Airframe & Cabin Safety Branch, ANM-115

Date: April 9, 2004

ELOS Originated by Wichita ACO:	Program Manager, Tina Miller	Routing Symbol ACE-117W
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